

Variable Trajectory - Fixed Launcher Grenade Technology:

For Armored Vehicles, Remote Turrets And Ground Robotics

By:

Howard D. Kent, ADG, LLC

&

Vincent Battaglia, Accurate Mag/BML Tool, Inc.



www.Accurate-Mag.com

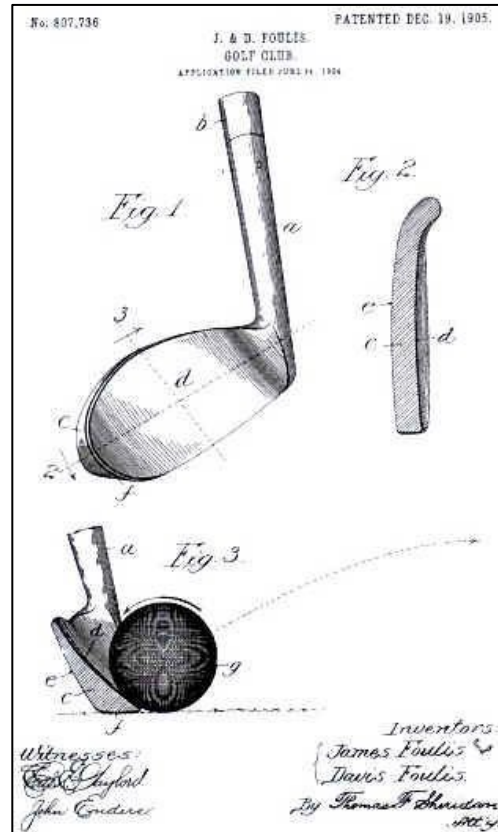
NOTE: Unclassified, Approved For Public Release

NDIA White Paper Series, Future
Force Capabilities Conference 2022

Contents:

- 3. Introduction
- 5. Problem: Actually **Aiming** Munitions From Fixed Launchers
- 7. Most Vehicles Already Have Defensive Smoke Launchers
- 9. A Variable Velocity / Multiple Trajectory Technology
- 12. Integrated Variable Velocity Cartridge Or Booster
- 13. Potential Applications; Frag vs. Smoke, Ground Robotics
- 16. Conclusions
- 20. Recommendations
- 21. Credits

Introduction:



USPTO Mashie Niblick Golf Club

NOTE: Unclassified, Approved For Public Release

Introduction:

Why Do Golfers Carry All These Different Clubs And More? *The Original 40mm Was Called The "Niblick" Or "Pitching Wedge" From Golf...*



To Make Different Shots? To Hit At Different Speeds And Angles?

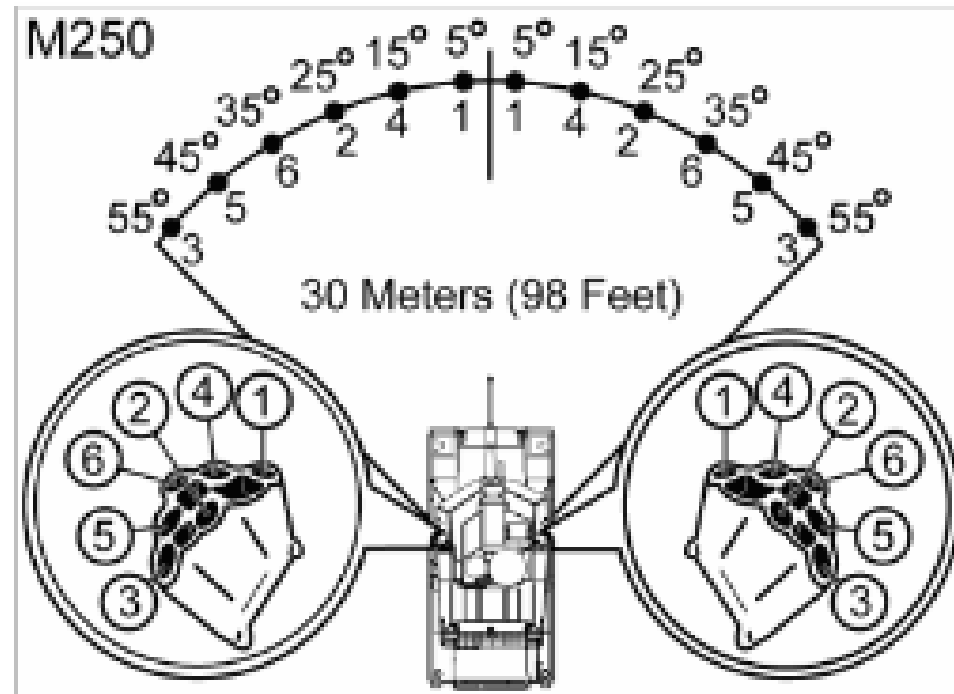
Might We Want To Make Different Grenade Shots, Except All With The Same Round?

Introduction:

"There Are Thousands Of Available Offensive Multiple Grenade Launch Tubes On The Battlefield Already...Mounted To Armored Vehicles, Remote Turrets And Ground Robots"

- The Theory Pursued Is Utilization Of Existing Launchers For New Applications.
- The Focus Is On 66mm Vehicle Mounted Defensive Smoke Launching Systems.
- Proposed Are Adjustable, Variable Trajectories For Grenades To Allow Fixed Angle Launchers To Fire At Multiple Distances To Enable Target Coverage.
- New Lethal And Less Lethal Payloads Would Be Possible Including Airburst Fragmentation Grenades, Riot Agents, Flash Bang Less Lethal, Marking...

Problem: Actually *Aiming* Munitions From Fixed Launchers

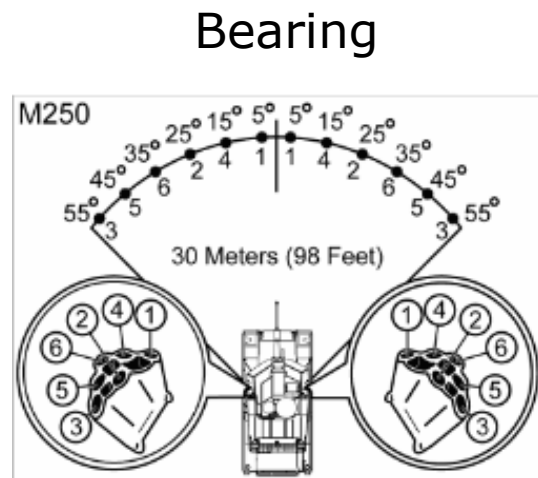


US DoD Via Sciendo.com Obscurant Dischargers

NOTE: Unclassified, Approved For Public Release

Problem: Actually **Aiming** Munitions From Fixed Launchers

Many Systems Can Launch To Specific Angles...What They Need Now Is Variable Distance To Cover Any Target Within The Maximum Range:



US DoD Via Sciendo.com Obscurant Dischargers



Range



Dark Earth Tactical Graphic



Fire!



Firing Solution:
Fire Right Hand Tubes
1 & 4 With Ranged
Fragmentation Grenade

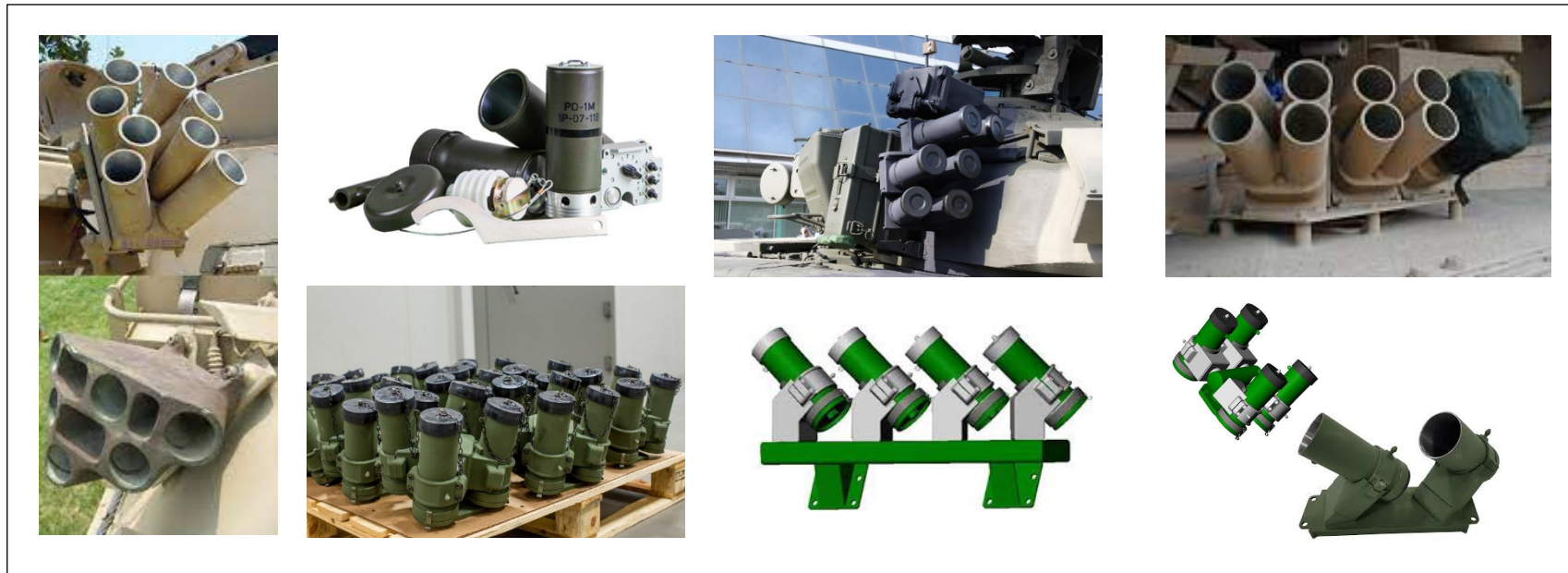
Most Vehicles Already Have Defensive Smoke Launchers:



US Army JPEO Abrams Photo

Most Vehicles Have Defensive Launchers:

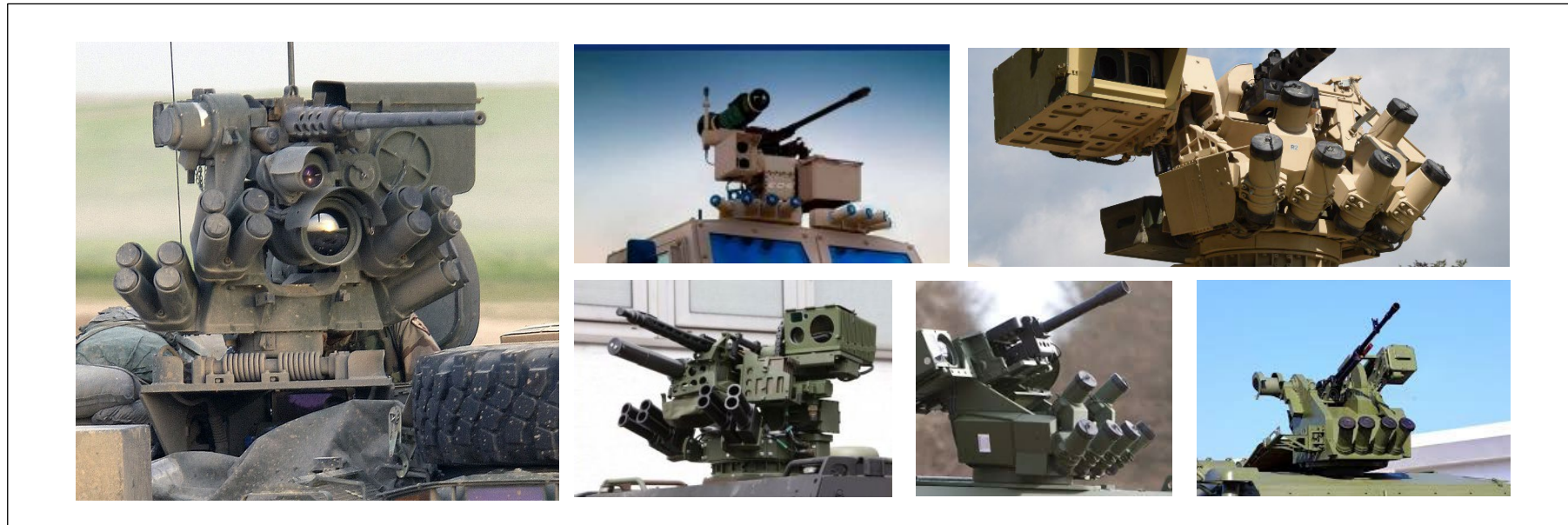
Variable Range Projectiles Offer Defense **AND** Offensive Action With Different Payloads...



Clockwise From Upper Left: US DoD Via Sciendo.com Obscurant Dischargers, Defense-Industries.com 66mm, Russian T90s, US Army Photo, GES Launcher Modules, GES Installation, Wegmann 66mm Launchers.

Most Vehicles Have Defensive Launchers:

Remote Turrets Are Also Frequently Equipped With Multi-Tube Launchers...



Clockwise From Upper Left: US ROWS, EOS Model 400, KMW RWS, Russian RWS, Belgian RWS, German RWS From Eurosatory 2022.

Most Vehicles Have Defensive Launchers:

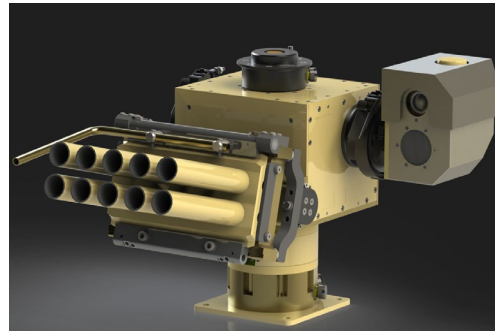
Several Forms Of Suitable Vehicle Mounted Non-Lethal Launchers:



From Left to Right: Demonstratable 66MM VENOM® MC Launcher and Smoke Munition Left, 40MM VENOM® Launching AWM from Kongsberg RWS at Crane NSWC 2012, VENOM® V-10 Tube Launcher Displayed on IRobot UGV Modern Day Marine 2010.

CSI VENOM MC, Multi-Caliber Less Lethal Launcher & Munitions

VENOM® MC, Multi-Caliber Interface System Concept:



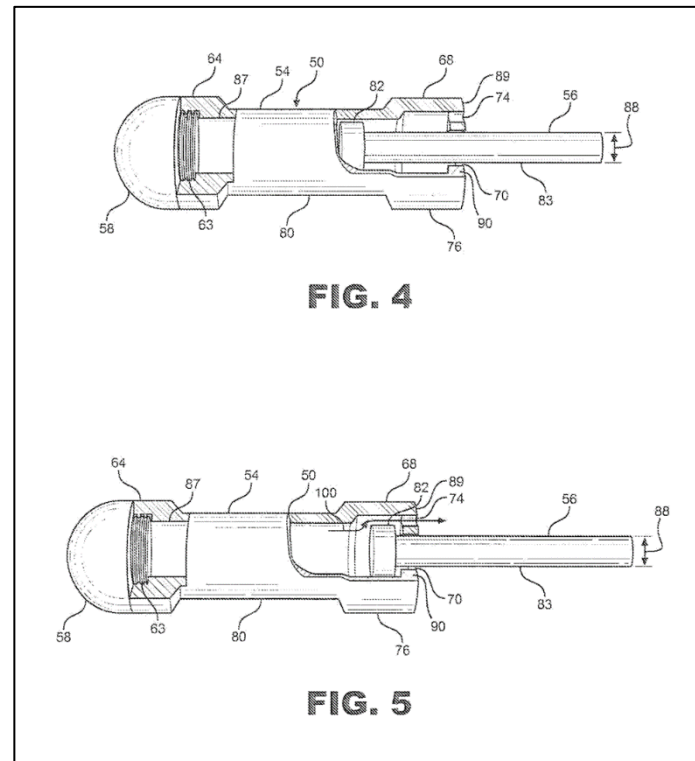
Operational

- Deploy Remotely or Direct Tethered Fire
- Interchangeable from Vehicles, ROWS, UGVs, Static Installations
- Supports Escalation of Force, Determination of Intent, Crowd Dispersal, Area Denial, and Obscuration Objectives
- Capable of Delivering Non-Lethal AWM, Smoke, Irritant, & Blunt Trauma Effects

Technical

- Electronically Primed Munitions
- Fire Control with Master Arm and Ready Trigger, also IP Addressable
- Area Impact & Aerial Burst Payloads
- Variable Range, Dependent on Munition
- Unloaded Weight 27 lbs.
- Dimensions: Width 15.9" Depth 17.7"
- Internal Power 9V Battery, Auxiliary Power Options
- Operating Temps -25° to +175° F
- Shock Resistance 1000 Shocks @ 200g Force

A Variable Velocity / Multiple Trajectory Technology:



USPTO Dr. Jeffery Widder, Battelle

NOTE: Unclassified, Approved For Public Release

A Variable Velocity / Multiple Trajectory Technology:

An Electrically Fired, Internal Charge Pedestal Launching System For Projectiles...

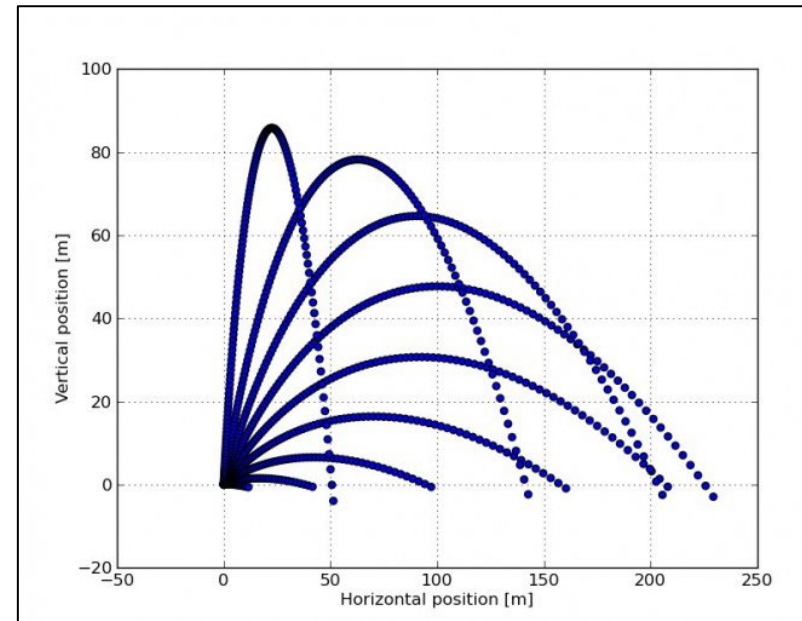
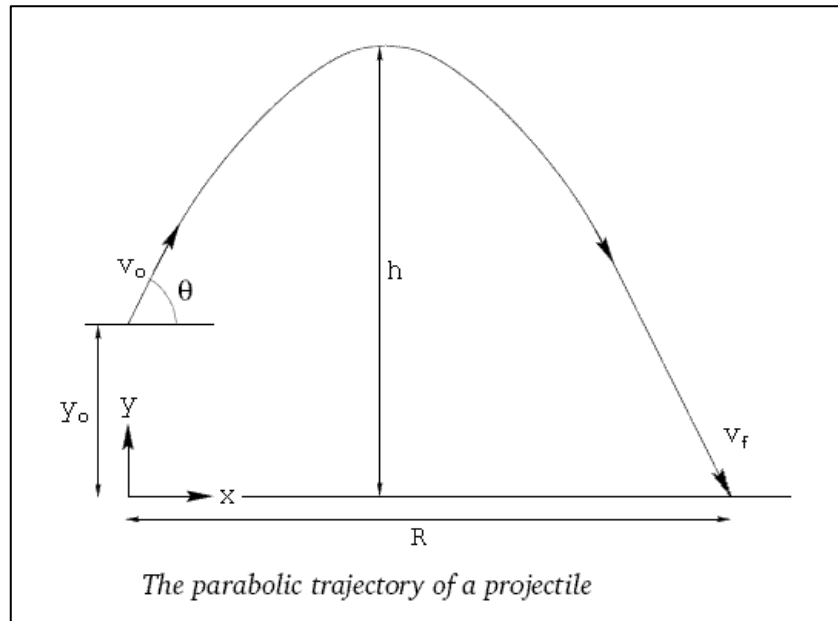
"Scalable From 0.50 Caliber Less Lethal To Two Pound 66mm Canister Grenades"



Clockwise From Upper Left: Wired Pogo-Jet Illustration, Battelle Fired CTNLS Round, Battelle Rifle Mounting, CAA Roni Pistol Conversion, Battelle Pistol-Roni Overlay, Lancer Stick Magazine, Pro-Mag Drum Magazine.

A Variable Velocity / Multiple Trajectory Technology:

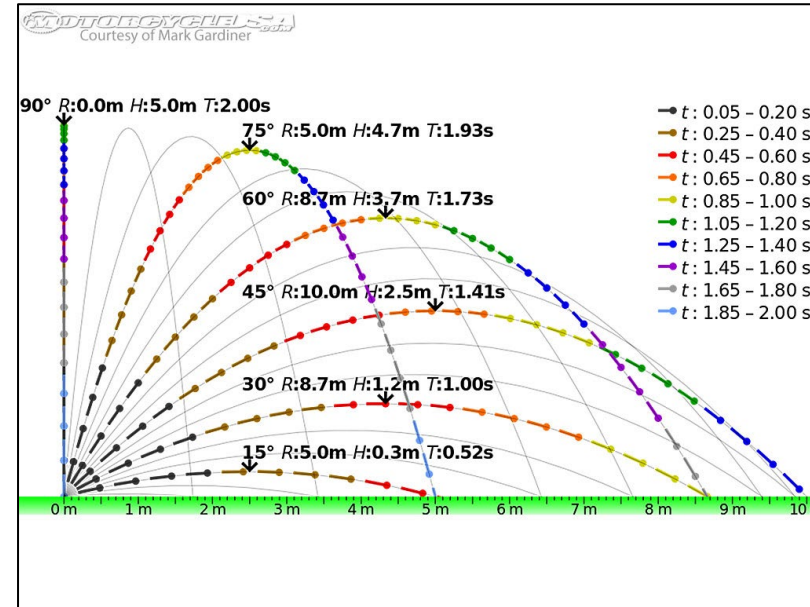
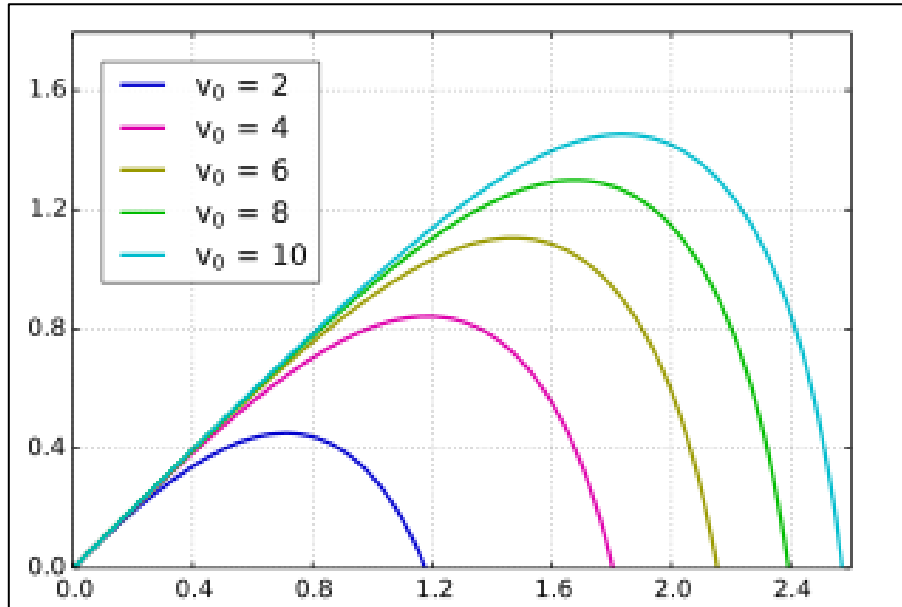
What We Have: One Velocity / High Trajectories vs. Range:



When You Launch At One Velocity, You Must Change Angle To Vary Range

A Variable Velocity / Multiple Trajectory Technology:

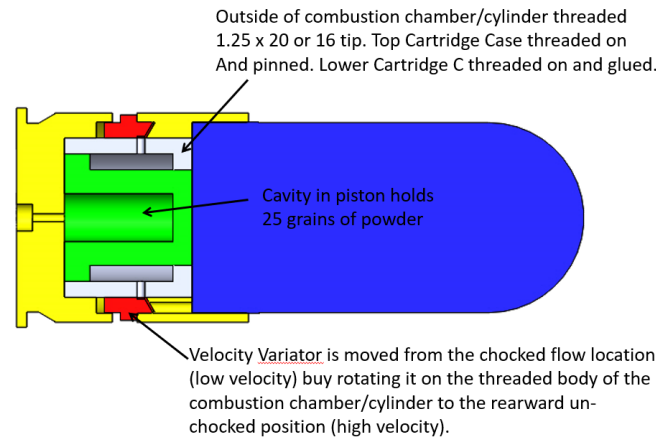
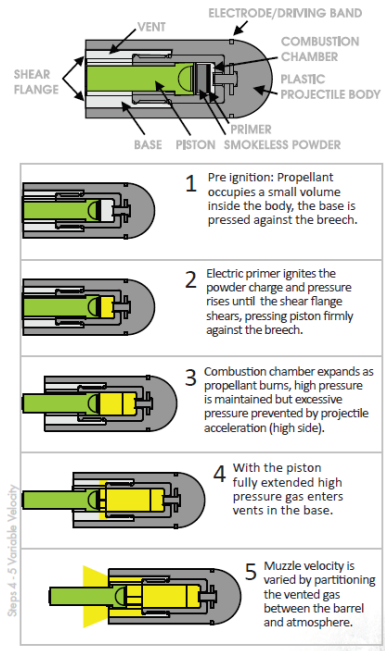
What We Can Have: Multiple Velocities / Variable Trajectories:



When You Launch At Many Velocities, You Don't Have To Change Angle To Vary Range

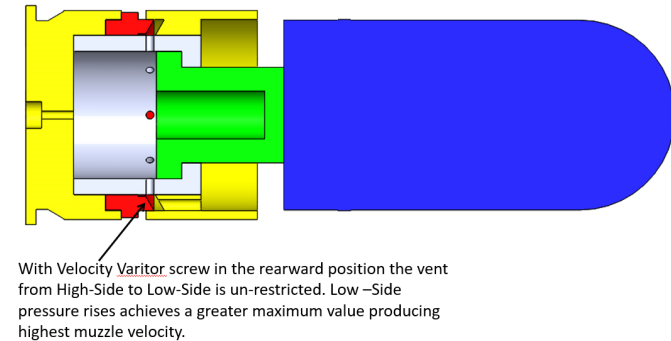
A Variable Velocity / Multiple Trajectory Technology:

What We Can Have: Multiple Velocities / Variable Trajectories:



The Greater The Force The Piston May Use To Boost The Payload...The Longer The Range Of The Projectiles.

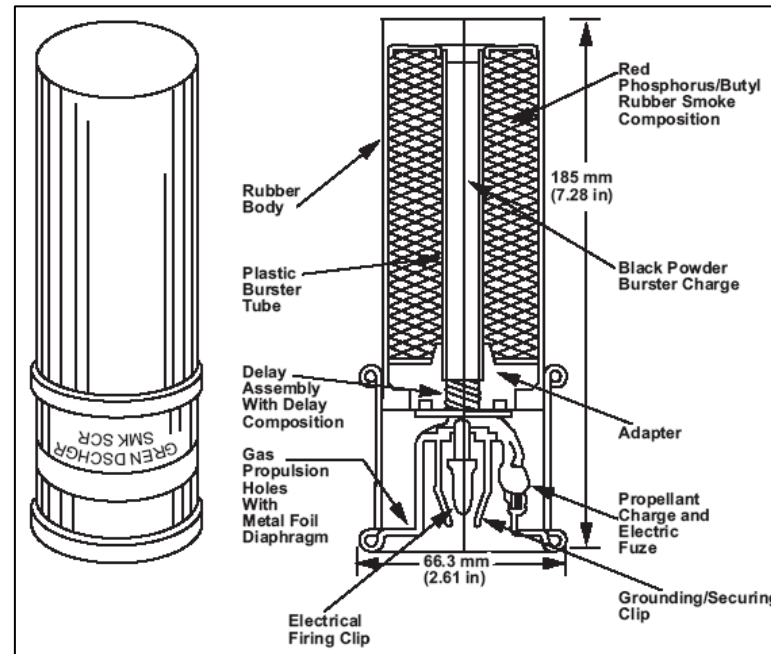
In The Less Lethal Variant The Breech Face Is Moved Forward And Backward From Impacting The Piston...In The Grenade The Range Is Set By Detent Rotation



Featuring: The **BML Tool Variable Velocity Grenade Concept**

NOTE: Unclassified, Approved For Public Release

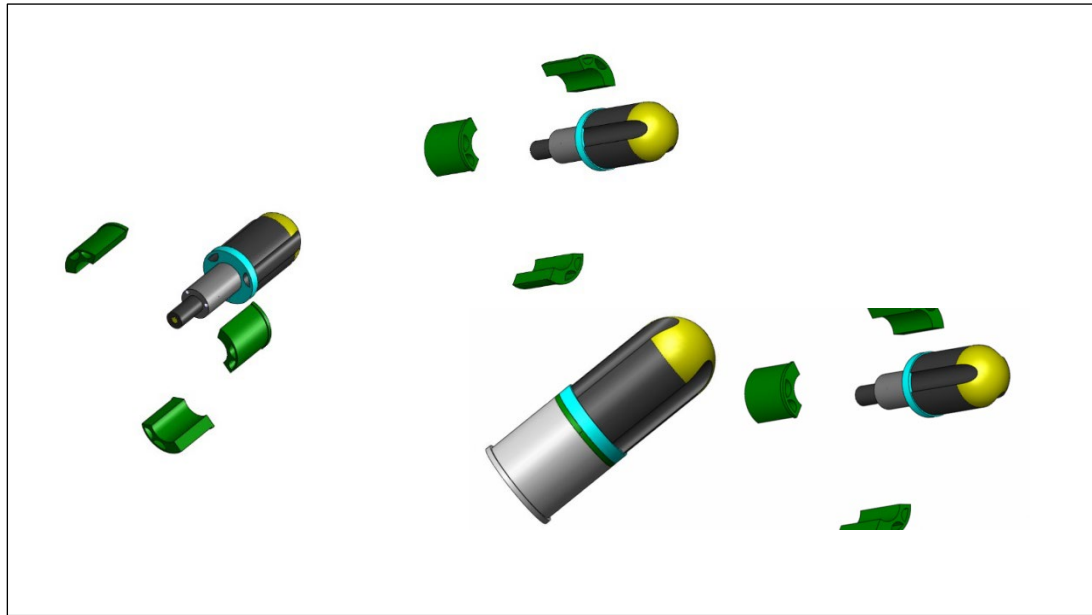
Integrated Variable Velocity Cartridge Or Booster:



US DoD Via Sciendo.com Smoke Discharger Cartridge

Integrated Variable Velocity Cartridge Or Booster:

What We Can Have: Multiple Velocities / Variable Trajectories:



- Grenade Body Twists To Range Detent Positions.
- Identical Loading And Firing Procedure As Smoke Round.
- Booster Is Cartridge Without Grenade Body To Launch Existing 66mm Payloads.

The Concept Is Identical 66mm Cartridges that Adjust For Multiple Ranges...

Integrated Variable Velocity Cartridge Or Booster:



Existing Smoke Screen 66mm Electric Fire

66mm vs 40mm

Put 3 Position Booster Into 66mm Base

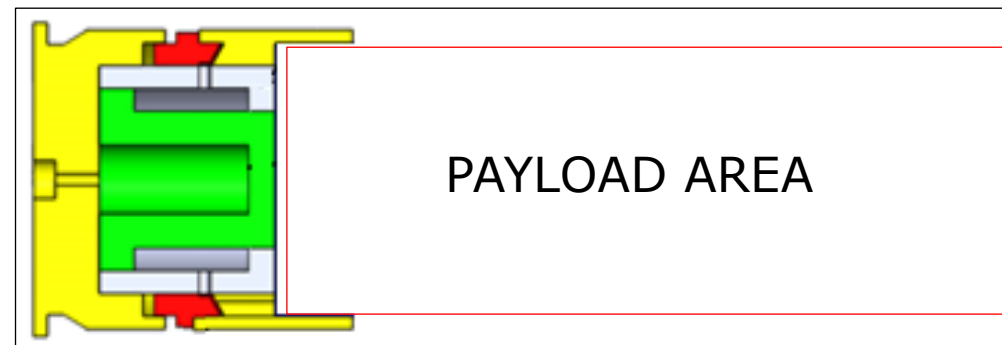
Example:
10 Yards
25 Yards
50 Yards

Universal Adjustable Booster For Existing 66mm Screening Smoke Launchers To Also Fire HE/Riot Canister Grenades...



Army ARL Stackable 66mm, CSI Smoke And CS Irritant 66mm Canisters

Booster Assembly For 66mm Provides A Huge Area For Multiple Payloads...



Booster Assembly May Be Packaged As A Completed Round Or A Separate Body For Use With Fragmentation, Smoke, Riot Agent, Drone, Surveillance Or Any Other Type Of Munition, Device, Etc. That Will Fit Within The Payload Area.

Potential Applications; Vehicles, Remote Turrets And Ground Robotics

1. Provide An Additional Offensive Capability To Vehicles With Existing Launchers.
2. Provide Small Robots And Remote Turrets With Aimable Weapon And Payload Capability For Non-Trainable Fixed Base Defensive Smoke Launchers.
3. Make Economical Fixed Site Land And Marine Based Launchers For Lethal Or Less Lethal Applications Utilizing Multiple Range / Velocity Capability.



Army Recognition Abrams Raphael Trophy, Textron Ripsaw M5, AP Somali Pirates, Times Of London US Embassy Cairo Egypt

Conclusions:

- The Variable Velocity Grenade Concept Can Greatly Augment The Offensive Firepower Of Large And Small Vehicles, Using Payloads Boosted From Their 66mm Launchers.
- Similarly, Ground Robotic Vehicles And Fixed Sites May Use Existing 66mm Launchers Which May be Aimed Via The Angle And Bearing Of Their Tubes Plus Variable Velocity.
- As Technology Advances Which Erodes The Protection Of Smoke Launchers, They May Be Used To Deploy Offensive Weapons, Drones, Surveillance Electronics, Etc.

Recommendations:

- Develop The Variable Velocity Grenade And Booster Technology For General Use In 40mm And 66mm Diameters.
- Initiate Programs For Weapons, Electronics And Drones Compatible With 66mm Smoke Launch Cartridge Tubes For Boosting Downrange.
- Find Additional Applications For The Tens Of Thousands Of Existing Smoke Launcher Systems To Add Combat Power To Previously Defensive Usage.



US Army Sierra Depot

Credits:



POC: Howard D. Kent, CEO, ADG LLC, Phone: 818-314-8636, e-Mail: HKent@Peak.org



POC: Vincent Battaglia, CEO, Accurate Mag/BML Tool Corporation, Phone: 203-880-9485
URL: www.accurate-mag.com



NOTE: Unclassified, Approved For Public Release

Credits:

With Special Thanks To:



POC: Paul Ford, VP Sales & Marketing, **Combined Systems, Inc. (CSI)**
Phone: 512-584-3710, e-Mail: PaulFord@CombinedSystems.com

Designers And Manufacturers Of Less Lethal Systems
Used Around The World...